

WHAT IS CLAIMED IS:

1. A data protection method for software applications on a mobile electronic device, the device having storage for allocation to respective software applications for data storage, including:

creating and storing a list of selected software applications operating on the mobile electronic device;

notifying the selected software applications of an impending storage cleaning operation; and

determining, for each selected software application receiving the notification, if any storage allocated thereto is to be released for cleaning during the impending storage cleaning operation and if so releasing the storage for cleaning.

2. The method of claim 1 including cleaning the released storage.

3. The method of claim 2 wherein the cleaning includes causing a garbage collector to implement the cleaning operation.

4. The method of claim 1 wherein an impending storage cleaning operation can be triggered by any one of a plurality of types of predetermined trigger events, the method including waiting for one of the plurality of trigger events to occur prior to the step of notifying the selected software applications of the impending storage cleaning operation.

5. The method of claim 4 wherein the step of notifying includes identifying for the selected software applications the type of trigger event triggering the impending storage cleaning operation, at least some of the selected software applications selectively releasing storage allocated thereto for cleaning based on the type of trigger event identified.

6. The method of claim 4 including determining if any of the selected software applications have indicated that they have released storage for cleaning, and if so, causing the released storage to be cleaned.

7. The method of claim 4 wherein at least one of the trigger events is selected from the group consisting of: a holstering event that occurs when the device is placed in a corresponding holster; an idle timeout event that occurs when the device is left idle by a user thereof for a predetermined time period; a synchronization start event that occurs when the device begins a synchronization operation with a computer; a synchronization end event that occurs when the device ends the synchronization operation with the computer; a memory cleaner event that occurs when a memory cleaning operation is initiated on the device; a time change event that occurs when a time setting of the device is changed; a device lock event that occurs when the device is locked; and a power down event that occurs as the device is about to power down.

8. In a mobile electronic device having a plurality of software applications operating thereon, at least some of the applications referencing objects for storing data in memory of the mobile electronic device, a method for protecting the data including, in the following order, steps of:

- registering selected applications;
- notifying the registered applications upon the occurrence of a trigger event;
- unreferencing at least some objects referenced by the registered applications based on the notification; and
- cleaning the memory to remove data stored in any unreferenced objects.

9. The method of claim 8 wherein the registered applications are notified upon the occurrence of any one of a plurality of different types of trigger events, and the registered applications are notified of the type of trigger event that has occurred.

10. The method of claim 9 wherein in the unreferencing step, at least some of the registered applications selectively unreference objects based on the type of trigger event.

11. The method of claim 9 wherein at least one of the trigger events is selected from the group consisting of: a holstering event that occurs when the device is placed in a corresponding holster; an idle timeout event that occurs when the device is left idle by a user thereof for a predetermined time period; a synchronization start event that occurs when the device begins a synchronization operation with a computer; a synchronization end event that occurs when the device ends the synchronization operation with the computer; a memory cleaner event that occurs when a memory cleaning operation is initiated on the device; a time change event that occurs when a time setting of the device is changed; a device lock event that occurs when the device is locked; and a power down event that occurs as the device is about to power down.

12. The method of claim 9 wherein the trigger events can be pre-selected by a user of the device.

13. The method of claim 8 including, prior to the cleaning step, determining if any objects have been unreferenced by the registered applications, and if not, forgoing the cleaning step.

14. The method of claim 8 wherein the cleaning step includes calling a wipe function to cause either all zeros, all ones or random data to be written to the unreferenced objects.

15. A mobile electronic device, comprising:
a microprocessor;
a plurality of software applications operable on the microprocessor;
a heap memory for storing objects used by the software applications;

a garbage collector module operable on the microprocessor for cleaning unreferenced objects in the heap memory; and

a memory cleaner module operable on the microprocessor for maintaining a list of registered applications selected from the software applications, and for notifying at least some of the registered applications upon the occurrence of a trigger event;

the registered applications being responsive to the memory cleaner module for unreferencing at least some of the objects in the heap memory used thereby upon receiving the notification from the memory cleaner module.

16. The mobile electronic device of claim 15 wherein there are a plurality of different types of trigger events upon the occurrence of any one of which the memory cleaner module notifies the registered applications, the notification including an identification of the type of trigger event.

17. The mobile electronic device of claim 16 wherein at least one of the trigger events is selected from the group consisting of: a holstering event that occurs when the device is placed in a corresponding holster; an idle timeout event that occurs when the device is left idle by a user thereof for a predetermined time period; a synchronization start event that occurs when the device begins a synchronization operation with a computer; a synchronization end event that occurs when the device ends the synchronization operation with the computer; a memory cleaner event that occurs when a memory cleaning operation is initiated on the device; a time change event that occurs when a time setting of the device is changed; a device lock event that occurs when the device is locked; and a power down event that occurs as the device is about to power down.

18. The mobile electronic device of claim 16 wherein at least some of the registered applications are configured for, upon receiving notification from the memory cleaner module, selectively unreferencing objects referenced thereby based on the type of trigger event.

19. The mobile electronic device of claim 18 wherein the registered applications are each configured for advising the memory cleaner module if any objects have been unreferenced thereby based on the notification, and the memory cleaner module is configured for causing the garbage collector module to clean unreferenced objects in the heap memory upon being advised by one or more of the registered applications that objects have been unreferenced thereby based on the notification.

20. The mobile electronic device of claim 15 wherein the device includes a display screen, the memory cleaner module being configured for generating on the display screen a user interface identifying the registered applications.

21. The mobile electronic device of claim 15 wherein at least one of the software applications is configured to automatically register with the memory cleaner module as a registered application when creating a predetermined category of data.